

## CLAIMS

1. A method for manufacturing a fuel cell separator for sandwiching from both sides via diffusion layers an anode and a cathode disposed on an electrolyte membrane, the fuel cell manufacturing method comprising:

a step of obtaining a mixture by mixing a thermoplastic resin and a conductive material, the thermoplastic resin being a resin selected from ethylene / vinyl acetate copolymers, ethylene / ethyl acrylate copolymers, straight-chain low-density polyethylene, polyphenylene sulfide and modified polyphenylene oxide, the conductive material being carbon particles of at least one selected from black lead, Ketchen black and acetylene black;

a step of forming with this mixture a separator starting material having gas flow passage grooves in a contact face thereof to contact the diffusion layer; and

a step of irradiating the contact face of this separator starting material with an electron beam.

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3. A method for bonding a fuel cell separator and an electrode diffusion layer, comprising:

disposing a carbon fiber electrode diffusion layer on a thermoplastic resin separator;

applying a welding pressure to the electrode diffusion layer

and separator; and

vibrating one of the electrode diffusion layer and the separator to produce frictional heat and thereby welding the electrode diffusion layer to the separator.

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4. A method for bonding a fuel cell separator and an electrode diffusion layer according to claim 3, characterized in that the welding pressure is 10 to 50kgf/cm<sup>2</sup> (about 980 to 4903kPa) and the frequency of the vibration is 240Hz.

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5. A method for manufacturing a fuel cell separator, comprising:

preparing a first separator and a second separator made of thermoplastic resin;

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bringing the first and second separators together and then applying a welding pressure to the first and second separators;

vibrating one of the first and second separators to produce frictional heat and thereby welding the second separator to the first separator; and

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covering cooling water passage grooves formed in at least one of the first and second separators with the other separator to form cooling water passages.

6. A fuel cell separator manufacturing method according to claim 5, wherein the welding pressure is 10 to 50kgf/cm<sup>2</sup> (about 980 to 4903kPa) and the frequency of the vibration is 240Hz.

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